H-II

Part of H-2 Family

H-2 Liftoff
Credit: NASDA

Heavy lift Japanese indigenous launch vehicle. The original H-2 version was cancelled due to high costs and poor reliability and replaced by the substantially redesigned H-2A.

AKA: H-2. *Status*: Retired 1999. *First Launch*: 1994-02-03. *Last Launch*: 1999-11-15. *Number*: 7 . *Payload*: 10,060 kg (22,170 lb). *Thrust*: 3,970.00 kN (892,490 lbf). *Gross mass*: 260,000 kg (570,000 lb). *Height*: 49.00 m (160.00 ft). *Diameter*: 4.00 m (13.10 ft). *Apogee*: 200 km (120 mi).

3 stage vehicle consisted of 2 x H-II SRB + 1 x H-II stage 1 + 1 x H-II stage 2

LEO Payload: 10,060 kg (22,170 lb) to a 200 km orbit at 30.40 degrees. *Payload:* 3,930 kg (8,660 lb) to a GTO. *Development Cost $:* 2,300.000 million. *Launch Price $:* 190.000 million in 1994 dollars in 1998 dollars.

Stage Data - H-2

- Stage 0. 2 x H-2-0. *Gross Mass*: 70,400 kg (155,200 lb). *Empty Mass*: 11,250 kg (24,800 lb). *Thrust (vac)*: 1,539.997 kN (346,205 lbf). *Isp*: 273 sec. *Burn time*: 94 sec. *Isp(sl)*: 237 sec. *Diameter*: 1.81 m (5.93 ft). *Span*: 1.81 m (5.93 ft). *Length*: 23.36 m (76.64 ft). *Propellants*: **Solid**. *No Engines*: 1. *Engine*: **H-2-0**. *Status*: In Production.

- Stage 1. 1 x H-2-1. *Gross Mass*: 98,100 kg (216,200 lb). *Empty Mass*: 11,900 kg (26,200 lb). *Thrust (vac)*: 1,077.996 kN (242,343 lbf). *Isp*: 446 sec. *Burn time*: 346 sec. *Isp(sl)*: 349 sec. *Diameter*: 4.00 m (13.10 ft). *Span*: 4.00 m (13.10 ft). *Length*: 28.00 m (91.00 ft). *Propellants*: **Lox/LH2**. *No Engines*: 1. *Engine*: **LE-7**. *Other designations*: LE-7. *Status*: In Production.

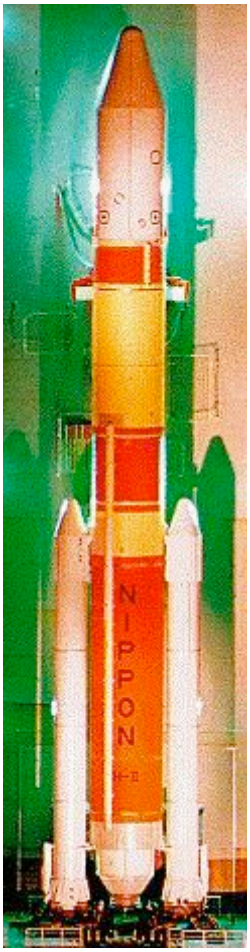
- Stage 2. 1 x H-2-2. *Gross Mass*: 16,700 kg (36,800 lb). *Empty Mass*: 2,700 kg (5,900 lb). *Thrust (vac)*: 121.500 kN (27,314 lbf). *Isp*: 452 sec. *Burn time*: 600 sec. *Diameter*: 4.00 m (13.10 ft). *Span*: 4.00 m (13.10 ft). *Length*: 10.60 m (34.70 ft). *Propellants*: **Lox/LH2**. *No Engines*: 1. *Engine*: **LE-5A**. *Other designations*: LE-5EC. *Status*: In Production.

***More at*: H-II.**

Family: orbital launch vehicle. *Country*: Japan. *Engines*: LE-7, LE-5A. *Spacecraft*: ETS, Himawari, HTV, FS-1300, OREX, VEP, SFU, ADEOS, Fuji, ETS-7, ETS-7 Target, TRMM, Kakehashi, LRE, DASH 2002, MDS, DRTS, USERS, FedSat, Mu-Labsat, WEOS Kanta-Kun, IGS, Daichi, DS2000, Kaguya, Kizuna, Ibuki, JAXA SDS, Kagayaki, KKS, Kukai, PRISM, SOHLA, SpriteSat. *Launch Sites*: Tanegashima, Tanegashima Y. *Stages*: H-2-1, LE-5EC, H-2-0. *Agency*: GMS, Mitsubishi. *Bibliography*: 2, 276, 296, 42, 455, 552, 554, 6, 61.

Photo Gallery

H-2 Cutaway view
Credit: NASDA



H-2
H-2 - COSPAR 1994-007

1994 February 3 - . 22:20 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II.

- **OREX** - . *Payload*: Ryusei. *Mass*: 865 kg (1,906 lb). *Nation*: Japan. *Class*: Technology. *Type*: Re-entry test vehicle. *Spacecraft*: OREX. *Decay Date*: 1994-02-03 . *USAF Sat Cat*: 22978 . *COSPAR*: 1994-007A. *Apogee*: 451 km (280 mi). *Perigee*: 450 km (270 mi). *Inclination*: 30.5000 deg. *Period*: 93.50 min. Orbital Reentry

Experiment. Orbital Re-entry Experiment Vehicle (OREX) Ryusei. Acquisition of data related to atmospheric reentry. Launch vehicle H-II rocket test flight H-II 1F. Launching organization NASDA. Launch time 2220:00 UT. .

- **VEP** - . *Payload*: Myojo / LAPS. *Mass*: 2,391 kg (5,271 lb). *Nation*: Japan. *Agency*: NASDA. *Class*: Technology. *Type*: Navigation technology satellite. *Spacecraft*: VEP. *USAF Sat Cat*: 22979 . *COSPAR*: 1994-007B. *Apogee*: 36,261 km (22,531 mi). *Perigee*: 449 km (278 mi). *Inclination*: 28.6000 deg. *Period*: 645.00 min.

  Vehicle Evaluation Payload; monitored H-2 performance. Vehicle Evaluation Payload (VEP) MYOJO. Provides a ranging function as well as functions to measure the acceleration and deformation, in order to confirm the accuracy of the H-II rocket orbit injection and understand the environment of the payload equipme nt. Launch vehicle H-II rocket test flight H-II 1F. Launching organization NASDA. Launch time 2220:00 UT.

1994 August 28 - . 07:50 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II. *FAILURE*: LAPS apogee kick motor failed to ignite. Partial Failure.. *Failed Stage*: 3.

- **Kiku 6** - . *Payload*: ETS 6. *Mass*: 3,800 kg (8,300 lb). *Nation*: Japan. *Agency*: NASDA. *Class*: Technology. *Type*: Navigation technology satellite. *Spacecraft*: ETS. *USAF Sat Cat*: 23230 . *COSPAR*: 1994-056A. *Apogee*: 38,677 km (24,032 mi). *Perigee*: 8,565 km (5,322 mi). *Inclination*: 13.2300 deg. *Period*: 861.84 min. Failed to reach geostationary orbit; Engineering Test Satellite; partial mission success. Also tested ion engines for NSSK..

1995 March 18 - . 08:01 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II.

- **SFU** - . *Mass*: 4,000 kg (8,800 lb). *Nation*: Japan. *Agency*: NASDA. *Class*: Materials. *Type*: Materials science satellite. *Spacecraft*: SFU. *Decay Date*: 1996-01-20 . *USAF Sat Cat*: 23521 . *COSPAR*: 1995-011A. *Apogee*: 483 km (300 mi). *Perigee*: 471 km (292 mi). *Inclination*: 28.5000 deg. *Period*: 94.10 min. Space Flyer Unit; carried materials, astronomy, biological experiments; retrieved by STS-72 1/20/96..

- **Himawari 5** - . *Payload*: GMS 5. *Mass*: 746 kg (1,644 lb). *Nation*: Japan. *Agency*: NASDA. *Class*: Earth. *Type*: Weather satellite. *Spacecraft*: Himawari. *USAF Sat Cat*: 23522 . *COSPAR*: 1995-011B. *Apogee*: 35,791 km (22,239 mi). *Perigee*: 35,784 km (22,235 mi). *Inclination*: 0.6000 deg. *Period*: 1,436.00 min.

  Geostationary Meteorological Satellite; carried search and rescue package. Stationed at 140.2 deg E. Positioned in geosynchronous orbit at 160 deg E in 1995; 140 deg E in 1995-1999 As of 5 September 2001 located at 139.99 deg E drifting at 0.028 deg W per day. As of 2007 Mar 10 located at 45.88E drifting at 3.134W degrees per day.

1996 August 17 - . 01:53 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II.

- **ADEOS** - . *Mass*: 135 kg (297 lb). *Nation*: Japan. *Agency*: NASDA. *Class*: Earth. *Type*: Atmosphere satellite. *Spacecraft*: ADEOS. *USAF Sat Cat*: 24277 . *COSPAR*:

1996-046A. *Apogee*: 800 km (490 mi). *Perigee*: 799 km (496 mi). *Inclination*: 98.6000 deg. *Period*: 100.90 min.

- **JAS-2** - . *Nation*: Japan. *Agency*: JARL. *Class*: Communications. *Type*: Civilian communications satellite. *Spacecraft*: Fuji. *USAF Sat Cat*: 24278 . *COSPAR*: 1996-046B. *Apogee*: 1,323 km (822 mi). *Perigee*: 801 km (497 mi). *Inclination*: 98.6000 deg. *Period*: 106.50 min. Japanese amateur radio satellite..

1997 November 27 - . 21:27 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II.

- **TRMM** - . *Nation*: USA. *Agency*: NASA Greenbelt. *Class*: Earth. *Type*: Atmosphere satellite. *Spacecraft*: TRMM. *Decay Date*: 2015-06-16 . *USAF Sat Cat*: 25063 . *COSPAR*: 1997-074A. *Apogee*: 403 km (250 mi). *Perigee*: 395 km (245 mi). *Inclination*: 35.0000 deg. *Period*: 92.50 min. TRMM was an international mission dedicated to measuring tropical and subtropical rainfall. The spacecraft and four instruments were provided by the USA, while Japan provided one instrument and launch services..

- **Hikoboshi** - . *Payload*: ETS-7. *Nation*: Japan. *Agency*: NASDA. *Manufacturer*: Toshiba. *Class*: Technology. *Type*: Navigation technology satellite. *Spacecraft Bus*: ETS. *Spacecraft*: ETS-7. *Decay Date*: 2015-11-13 . *USAF Sat Cat*: 25064 . *COSPAR*: 1997-074B. *Apogee*: 548 km (340 mi). *Perigee*: 545 km (338 mi). *Inclination*: 35.0000 deg. *Period*: 95.50 min.

  The Orihime and Hikoboshi satellites undocked and redocked on July 7 1998 in the FP-1 test of automated docking systems. Despite claims of the NASDA space agency that this is a first, automated Russian craft have docked on many occasions since the Kosmos-186/188 docking in 1968.

- **Orihime** - . *Payload*: ETS-7 Target. *Nation*: Japan. *Agency*: NASDA. *Manufacturer*: Toshiba. *Class*: Technology. *Type*: Navigation technology satellite. *Spacecraft Bus*: ETS. *Spacecraft*: ETS-7 Target. *Decay Date*: 1999-01-27 . *USAF Sat Cat*: 25424 . *COSPAR*: 1997-074E. *Apogee*: 458 km (284 mi). *Perigee*: 346 km (214 mi). *Inclination*: 34.5000 deg. *Period*: 92.60 min. Attached to Hikoboshi. It would later separate and serve as a passive docking target for the Hikobishi active automatic docking technology spacecraft..

1998 February 21 - . 07:55 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II.

- **Kakehashi** - . *Payload*: COMETS. *Nation*: Japan. *Agency*: NASDA. *Manufacturer*: NEC, Toshiba. *Class*: Communications. *Type*: Civilian communications satellite. *Spacecraft*: Kakehashi. *USAF Sat Cat*: 25175 . *COSPAR*: 1998-011A. *Apogee*: 17,727 km (11,015 mi). *Perigee*: 1,033 km (641 mi). *Inclination*: 30.1000 deg. *Period*: 328.10 min.

  Kakehashi, meaning 'Bridge', was called Communuications and Broadcasting Experimental Test Satellite (COMETS) before launch. It contained Ka-band communications and inter-satellite data relay payloads. Premature shutdown 44 seconds into the H-II second stage second burn put the satellite into a much lower

than planned orbit. The on-board Unified Propulsion System was used to raise it to a more useful orbit.

1999 November 15 - . 07:29 GMT - . *Launch Site*: Tanegashima. *Launch Complex*: Tanegashima Y. *LV Family*: H-2. *Launch Vehicle*: H-II. *FAILURE*: Failure during first stage burn.. *Failed Stage*: 1.

- **MTSAT** - . *Mass*: 2,900 kg (6,300 lb). *Nation*: Japan. *Agency*: NASDA. *Manufacturer*: Palo Alto. *Class*: Communications. *Type*: Civilian communications satellite. *Spacecraft*: FS-1300.

  Multi-functional Transportation Satellite intended to provide communications and air traffic control for the Japanese transportation ministry and a meteorological data for the Japanese Meteorological Agency. The spacecraft had a mass of 1223 kg dry and was a follow-on to the GMS (Himawari) weather satellite series.
